

Etiology and Treatment
of Nasal Catarrh, with
Special Reference to the
Deviated Septum
By

William O. Jarvis M.D.,
Medical Record Mar. 14, 1885

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1883. Bazy: Tumours de la Vessie Pousson. Paris, 1884.
 1883. Wells: Two cases. London Lancet, January 27, 1883.
 1884. Tiffany: Papilloma. Maryland Medical Journal, January 10, 1885.
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THE ETIOLOGY AND TREATMENT OF NASAL CATARRH, WITH SPECIAL REFERENCE TO THE DEVIATED SEPTUM.¹

BY WILLIAM CHAPMAN JARVIS, M.D.

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Few diseases have, until in recent years, at least within the last decade, occupied a more obscure position as regards their pathology and therapeutics than those involving the nasal passages. Such, as is generally acknowledged, being the case, it is not surprising that chronic nasal catarrh should be classed among the "opprobria medicinae," giving rise to the somewhat general impression that it is an incurable disease. It seems to me to be our duty as medical men to determine whether this belief is based upon the reliable testimony of carefully conducted scientific investigation, and if not to promptly condemn the circulation of such an erroneous opinion.

In pursuance of a line of inquiry, recommended by me in 1880,² I will seek the solution of this unsettled question by discovering and removing the cause and effects. In 1882³ I extended this line of thought and considered more in detail the part played by the deviated septum in nasal catarrh, accentuating as in the first paper, pressure irritation produced by contact of the septum with the turbinated tissues. I also gave my grounds for attributing chronic rhinitis to this and defective nasal drainage and finally offered novel remedial methods for dealing with the deflected septum.

In order to simplify and at the same time systematize the description of this deformity, I have for several years employed a classification which, at least, possesses the merit of simplicity, in addition to other advantages already enumerated by me.

Deviation of the septum narium may obviously be either, in character, osseous, cartilaginous, osseo-cartilaginous, or hypertrophic. In form these varieties may be either localized, that is, limited to small portions of the septum, or general, involving the whole extent or a large surface of the septal structure. I cannot discuss here my reasons and right for employing so simple a classification, suffice to say for the present it accords with the various conditions, and has afforded me an excellent guide for the surgical management of these conditions.

Osseous deflection of the septum rarely occurs alone, being almost invariably associated with the cartilaginous form, namely, osseo-cartilaginous. Long-standing deviated septa always exhibit hypertrophic changes over their most prominent points. These changes are due to pressure against structures lying opposite, *i.e.*, the turbinated bones. By far the most frequent form of deviated septum is the cartilaginous variety. As regards the question of the manner in which the deviated septum plays the part of a cause, I would ask attention to two most prominent and common factors, accounting for the production and persistence of the catarrhal processes in the majority of cases, namely, pressure irritation and defective nasal drainage. Farther on I shall have occasion to show that these conditions are also traceable to other important underlying causes of a more or less direct nature. The part played by pressure irritation in the causation of rhinitis hypertrophica I described in a paper read before the American Laryngological Association, session of 1880.⁴ My deductions were based upon the

careful and continuous study of a case exhibiting a frequent pathological condition, consisting of a thickening of the mucous membrane overlying the posterior borders of the vomer, shown in this drawing, taken from a life sketch (Fig. 1). I was persuaded that the hypertrophied tissues



FIG. 1.

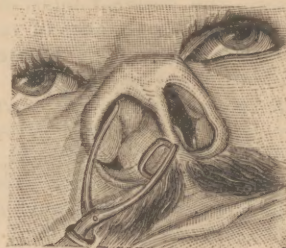


FIG. 2.

were caused by pressure of the turbinated structure lying opposite. This impression was received by my observing that the shape of the tumefaction was cup-shaped, and that the depression corresponded in shape and size with the convexity of the nearest turbinated bone. At times the depression was entirely concealed by the temporary impaction against its surface of a congestive turbinated hypertrophy. Retraction of the erectile structure soon revealed the mischief it had wrought by persistent contact, or in other words, by prolonged pressure irritation.

Do not understand me as attributing any particular pathological importance to this condition. I only consider it of value as proving the existence of a special determining factor in nasal catarrh, namely, pressure irritation.

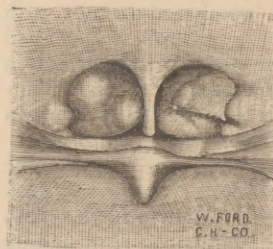


FIG. 3.

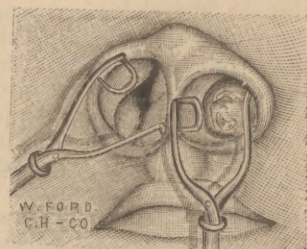


FIG. 4.

The drawing (Fig. 2.), taken from a life sketch, exhibits the action and effects of pressure irritation. The right anterior naris shows the deviated tissue pressing against the opposite turbinated structure. In the right posterior naris (Fig. 3) is seen the result—a post-inferior turbinated hypertrophy, almost entirely occluding the choana.

The next drawing (Fig. 4) was taken from a life sketch, showing an antero-inferior turbinated hypertrophy in the left nostril, caused by the combined catarrhal extension, and respiratory irritation from a deviated septum closing the right nostril.

I will now consider the second etiological factor, mentioned by me—defective nasal drainage. All intelligent observers must have been impressed with the fact that the peculiar inclination and semi-ovoid form of the nasal floor subserved a useful purpose, namely, that of a gutter for the efflux of nasal secretions and accretions. This view, described by me several years ago, has steadily gained ground in my mind until I find myself this evening prepared to present it in a more elaborate and favorable form.

This diagram (Fig. 5), built up from drawings of the normal structures will enable you to trace with me the nasal discharges from their origin, through the pharynx and gullet, until, with the salivary and buccal secretions, they find their way into the stomach. The heavy, dotted lines represent the course of the nasal fluids. Beginning at the anterior portion of the nasal gutter, the nasal mucus streams slowly downward over the easy convexities of

¹ Read before the New York Academy of Medicine, March 5, 1885.

² Archives of Laryngology, vol. ii., p. 147.

³ Archives of Laryngology, vol. iii., p. 300.

⁴ Loc. cit.

the turbinated bodies, and striking the nasal floor, gravitates backward along its gradual incline toward the posterior nares and pharynx. Posteriorly it is prevented from oozing down along the uvula and dripping into the larynx or pharynx by a slight elevation of the mucous membrane over the palate, which I have denominated the palatine prominence (*prominentia palatina*). This peculiar ridge-like elevation (Fig. 5, *pp*), beginning at the lower edge of the vomer and extending backward to a point just over the uvula, has, as far as I have been able to ascertain, been assigned no special function; the absence of this constant condition, in numerous drawings of the posterior nares, is a familiar example of its oversight. An attack of acute uvulitis, with obliteration of this palatine prominence, and consequent discharge of mucus into the larynx and pharynx, will convince one

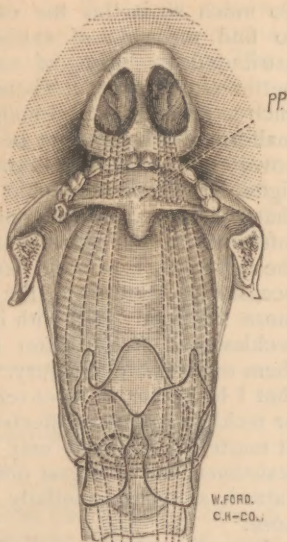


FIG. 5.

of its value in the economy of the throat. After leaving this point, the nasal fluids stream down, in a fan-shaped manner, along the pharynx, to the gullet. The discharges are prevented from falling into the larynx by the semi-circular ridge formed by the arytenoid and Wrisberg prominences and their various folds.

The importance of this system of nasal drainage is very clear, when one considers that it not only disposes of the natural excess in moisture, employed for olfaction, moistening the respired air, etc., but also is a means for the removal of the accumulations from the eye and accessory nasal cavities. This system once understood, it is easy to appreciate the consequences due to disturbance of its balance. Prominent among disturbing causes is the deviated septum. This interference, on the part of a deviated septum, is invariably associated with more or less turbinated hypertrophy. To these combined conditions are to be attributed most of the troubles due to defective drainage. Nasal mucus, of the proper specific gravity, readily finds its way into the stomach as just described. The obstruction presented by a deviated septum stops the nasal fluids on their way into the throat, the retardation leading to evaporation and consequent inspissation of the nasal discharges, producing the well-known train of symptoms, such as clogging of the nostrils, dropping of phlegm into the pharynx and larynx, etc.

The importance of pressure irritation and defective nasal drainage merits a more extended notice than I have accorded it, but the consideration of other causes which help to account for their existence urges me to leave it for the present.

Deviation of the septum can be traced as originating from certain well-defined causes, conspicuous among which I might mention heredity, traumatism, and acquired deviation of the septum.

Heredity.—In 1880 I reported¹ a case of congenital stenosis relieved by operation, in which was noted a peculiar malformation of the superior maxilla, and I sought to establish a relationship between it and the co-existing coryza and turbinated hypertrophies. Since then, by dint of close investigation and comparison, I have been able to supply the necessary links in a chain of evidence which demonstrates, at least to my mind, that one of the most common indirect causes of catarrh is to be found in the conformation of the hard palate. This peculiar malformation is transmitted from parent to offspring, and by its proper recognition we can at once account for the origin

of a vast majority of certain cases of chronic nasal catarrh. Attention has been called, from time to time, to the various congenital conditions of the hard and soft palate, known as cleft palate, bifid uvula, etc. I shall, however, have nothing to say concerning these malformations. Several years ago a medical student, whom I was examining, called my attention to the great height of the roof of his mouth. I had been treating him for an extreme deflection of the nasal septum; the deviated structure was pressing directly against the left lateral nasal wall and had been in this position as far back as he could remember. I at once associated the high-pitched and narrow palatine arch with the bend in the septum, reasoning that inasmuch as the septum lay directly over the point of highest elevation, there must be a corresponding bulging of this structure, its amount depending upon the extent of encroachment of the elevated and contracted arch upon the nasal chambers.

Subsequent observations not only proved this inference to be correct, but also enabled me to trace the condition in many instances to its origin, the parent. These plaster impressions, kindly presented to me by Dr. Eddy, nicely illustrate this peculiar palatine formation. They were selected from among thirty other plaster casts, as the only two in which I could positively pronounce the existence of a chronic nasal catarrh. The doctor then referred to the name of the subject, who, happily for me, proved to be one of my old patients, afflicted with a severe catarrh, and almost forgotten by me. This was the only case of well-marked catarrh sent me by the Doctor, and both casts had been taken from the same patient.

On comparing this plaster impression (Fig. 6) with the normal palatine arch, you will readily discern certain



FIG. 6.

well-defined differences. The distance between the alveolar ridges is much greater in the normal specimen. The transverse diameter in the abnormal specimen is not only smaller, but its surface is markedly irregular.

The palatine arch may be considerably higher than this normal specimen, and yet not constitute a pathological condition. No two palatine arches are exactly alike, and some show an elevation readily mistaken for a deformity. The important distinction to bear in mind is the abrupt elevation along the line of the median raphe. When such a condition is observed, we may at once look for, and, in my experience, invariably find, a corresponding deviation of the septum.

Such, in numerous cases observed by me, has always proved the case, and the condition has been invariably associated with a chronic rhinitis. Indeed, I believe it is possible to diagnosticate the existence of a chronic nasal catarrh by the simple inspection of the roof of the mouth, or, what amounts to the same thing, an impression in wax or plaster sent from any part of the world. Having interested myself from time to time in the study of the external nose, and particularly in the persistence of certain types in the same family, I was induced to consider it a special hereditary manifestation.

By employing a similar method of reasoning to the internal configuration of the nares, I have been able to

¹ Archives of Laryngology, vol. ii., p. 105.

trace the same condition back to a common parental origin. This, in my experience, occurs as an hereditary manifestation with great constancy. Once the peculiar nasal type of the parents recognized, its modifications in the children is easily determined. Sometimes this condition, with the co-existing intra-nasal catarrhal processes, can be inferred or diagnosticated at a distance by the conformation of the nose and the alveolar borders of the upper jaw. Last year I was afforded an excellent example of this in the family of a physician, the facial expression of whose children I had the opportunity of observing at a respectful distance. I afterward became acquainted with the gentleman, and was consulted by him concerning a throat affection afflicting his wife. I surprised the doctor by not only diagnostivating the catarrhal troubles of his children, but also satisfied him that the peculiar shape of his hard palate accounted for the existence of the disease in his offspring.

A few days since I examined several members of the same family, all adults, the condition of whose nostrils I correctly diagnosticated through a single member of the same family, who happened to be my patient.

In this family the nasal asymmetry was very well marked, the septum in one instance being deviated to such an extent as to disturb the external symmetry of the nostril. All the young men, three in number, possessed the paternal nasal type and palatine arch in an exaggerated form. All have suffered with nasal catarrh, dating far back in the memory of the family, and, I am informed that an absent son, not yet examined by me, is severely afflicted with the same complaint. The patient, an engineer by profession, and a very intelligent individual, referred to me by Dr. J. L. Corning, stated, without giving me his name, that a physician had informed him that his condition was due to a scrofulous taint probably inherited from his father. This piece of news did not surprise me, since it was only a few years ago that a statement was made in this Academy involving a similar proposition; and just here I would like to emphatically express my disagreement with this too prevalent idea of a diathesis or specific constitutional taint being the determining factor in the majority of those suffering with nasal catarrh from childhood. Furthermore, the view that these manifestations, though not retracable one or more generations, are nevertheless to be attributed to diluted syphilis of several preceding generations, seems to me even more unreasonable, and yet we find it mentioned in recent works on the subject and soberly discussed by physicians. Although scrofula and inherited syphilis are responsible for certain cases of catarrh, it is high time that these stigma, too often placed upon innocent and intellectual families, should be removed. I say intellectual advisedly, for it is my conviction that remarkable mental development is likely to be associated with a nasal catarrh.

It is well known that a marked increase in the dimensions of the cranial dome is apt to be accompanied by a contraction of the osseous framework of the face. A remarkable example of this kind lately came under my notice, in the person of a girl, aged sixteen, the daughter of a physically and intellectually enormous man. The father's head measured seven and three-eighths inches, and yet his large hat closely covered the head of his delicate little daughter. She, in other words, possessed the face and body of a child, with the head of a Webster. I was not surprised to find the contracted nares of this child the seat of extensive disease. If you compare these two sections taken from a wax cast, you will observe the high palatine arch of the father is markedly exaggerated in his daughter. I could cite numerous other instances in proof of the correctness of this view did time and space permit. From what has been said, I think I can safely say that early acquired nasal catarrh, instead of being of scrofulous or diluted syphilitic origin may in many cases prove to be an intellectual disease.

I will now briefly consider the second mentioned direct

cause of a deviated septum, and indirect cause of nasal catarrh, namely, traumatism.

Traumatism.—The effects of injury as an etiological factor, are identical with those resulting from heredity. So much so is this the case that I am not surprised to find the bulk of easily discernible deviated septa attributed to blows of various kinds, for want of a better explanation. There is now but little excuse for such a mistake, for although the deviated septum of a malformed maxilla may be increased by injury, the discovery of such a condition, associated with the usual signs, furnishes reasonable grounds for the assumption that it is hereditary and not of traumatic origin. This inference is, of course, strengthened by the history of the patient. Traumatic deviation of the septum, though occasionally found in the higher strata of society is more frequently met with in low life, the exposure and recklessness of the latter class of individuals rendering them more liable to injury. As an example I might state that I have yet to discover the nostril of a prize-fighter or reckless sparrer unaffected with a chronic nasal catarrh. It matters little what may be their so-called powers of resistance, the strongest must as surely succumb to nasal catarrh as a child similarly afflicted from a button in the nose.

By acquired or induced deviation, the third variety mentioned by me, I include such internal agencies as prolonged intra-nasal pressure upon the septum, as produced for instance by turbinated hypertrophies, polypi, and various tumors, the action of foreign bodies, inflammatory infiltration, the frequent employment of the finger for freeing the nostrils, etc.

The indirect influence of the high-pitched palatine arch and deviated septum observed in the production of aural, pulmonary, and eye troubles, also gelatinous polypi, and other intra-nasal growths, and its interesting etiological relation to phthisis must be passed by for the present, with little more than a mere mention.

Treatment.—I shall conclude my remarks with a necessarily brief consideration of the treatment of deviated septa. Employing a modified scriptural paraphrase of Dr. Didama's, "and now abideth Physiology, Pathology, and Therapeutics, these three, but the greatest of these is Therapeutics."

In other words, just in proportion as the first two elements add meaning to the third, are they to be valued as aiding in the one grand effort to ameliorate the misery of mankind. To accentuate this point I may be permitted to recall a remark made by a distinguished anatomist, the late Dr. Darling, who several years ago, after encouraging me to enthusiastically converse upon certain pathological conditions observed by me in the nose, suddenly interrupted the conversation with the remark, "But do you cure your patients?" That, gentlemen, is the important question with all of us.

An experience derived from several hundred operations has convinced me that no single method can be fairly recommended or successfully employed to remedy all deviated septa. Assuming the correctness of the propositions embodied in my previous remarks, I shall discuss the treatment of the deviated septum, as a most common cause of catarrh. As with a button in the nostril, so that thorn in the flesh, a deviated septum, must be removed to cure the catarrh.

Since several instruments will be presented to your notice, I trust you will not interpret them as indicating dissatisfaction with any one method and recourse at random to another, but as providing against certain possible contingencies. The very structure and shape of the septum warrants this assertion. We may meet bone, cartilage, or mucous membrane. The bone will dull or break our knives, the rongeur-forceps may strip off and mutilate unnecessarily the mucous membrane, and either may unfortunately perforate the deviated cartilage. For opening the field of operation I employ my ring-drop nasal speculum, since in my hands it has proved the

best for painlessly and persistently dilating the nostrils. In the treatment of cartilaginous and soft structural deviations of the septum, I have for several years employed nothing more than my *écraseur* with transfixion needles. Instead of using the No. 5 piano wire originally recommended and introduced by me for the removal of turbinated hypertrophies, I employ No. 0 and 00 piano wires. The exclusion of the question of hemorrhage in operations by *ecrasement*, is an additional recommendation for the employment of fine wires, cutting like knives. The employment of the *écraseur* for this purpose must be invariably combined with the use of my transfixion needles. These needles (Fig. 7) require no special description. They are pointed like the ordinary glover's needle.

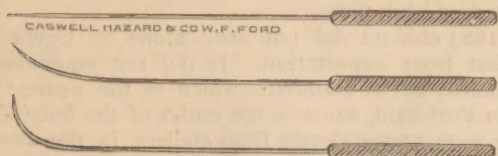


FIG. 7.

Four sizes are made, running from one to four inches in length. Each number has a straight needle and three others of varying curves. They are all furnished with a light, convenient handle.

The removal of cartilaginous and soft deviated tissues by *ecrasement* has been followed by most excellent results in my hands, and where there is plenty of time at the operator's disposal, it is to be preferred for this purpose.

It is often desirable to economize time, and in order to do so I have devised instruments with which I have most satisfactorily accomplished this purpose. They are essentially cutting instruments, and consist of a fenestrated cartilage forceps and trimming scissors. Their blades are made almost at a right angle to enable the operator to obtain a clear view of the field.

The cutting edges of the fenestrated forceps (Fig. 8)

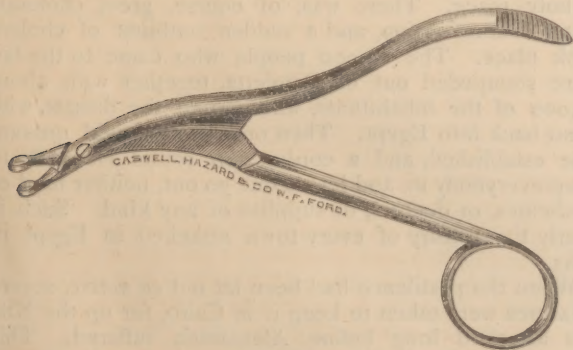


FIG. 8.

resemble somewhat, in shape and action, the ordinary ticket-punch. A ring on the fixed blade is intended to slip over the middle finger, and a knob on the free one is manipulated with the thumb. This arrangement enables one to seize and divide the cartilage with great facility. The trimming scissors (Fig. 9) are convenient for removing asperities remaining after the other instruments have been employed. The instrument is grasped like a pistol, firm pressure being exercised against its lateral margin by the index finger.

Thus far the instruments shown have applied only to cartilage and hypertrophied mucous membrane. Bone blunts or breaks their keen edges, and we may have to treat an osseo-cartilaginous deviation of the septum.

This little instrument (Fig. 10), essentially a rongeur forceps, has, in my hands, most satisfactorily accomplished this result. Its two blades are hollowed to cut like the teeth of a rodent. The instrument has the proper nasal curve.

A great advantage possessed by this bone forceps is the control exercised over it by the operator. Each osseous projection can be distinctly distinguished over the edge of the upper blade and deliberately crushed away by the keen-edged cutting surfaces, and by a kind of gnawing process large sections of the bone are

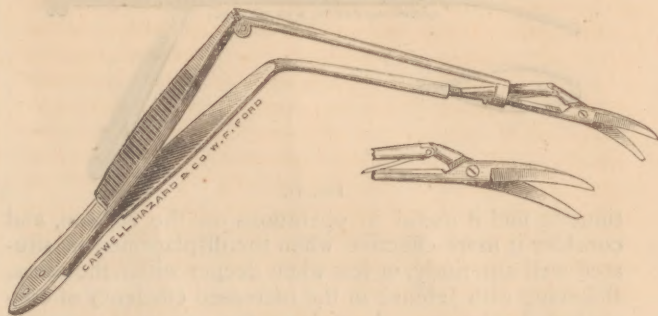


FIG. 9.

removed with rapidity and precision. All the methods thus far mentioned accomplish their purpose by removing the superfluous or deviated tissues or the turbinated structures opposite the deviated point.

Although this, in the majority of instances, can be accomplished without perforating the septum narium, or weakening the nasal supports, it is obvious that a certain class of cases, usually those presenting an extreme degree of deflection, may be followed by the above-mentioned undesirable consequences. I have, therefore, made it a rule to resort to a different method in this class of cases. This consists in the employment of Steele's stellate punch in conjunction with a peculiar nasal clamp or splint. Probably the least important feature of the operation is the cutting part, at least such a view is now current. The great difficulty rests in the proper approximation of the divided fragments, and just at this stage the bad results show themselves. While observing the behavior of a case operated upon and afterward treated by the usual method, the nasal plug, I was convinced that just here the trouble arose. From what I have already said, you will thoroughly appreciate the effects of such a foreign body lodged within the nostril. The intense irritation and secondary hemorrhage, profuse rhinorrhœa, high fever and inflammation, and general misery, is no exaggerated picture in my experience. Why, then, should we expect other than unfavorable results from the practice of this method? This little clamp has, in my practice, relegated these inconveniences to the history of the past. The septum, made sufficiently plastic by means of the punch, is simply held in place by a slight pressure

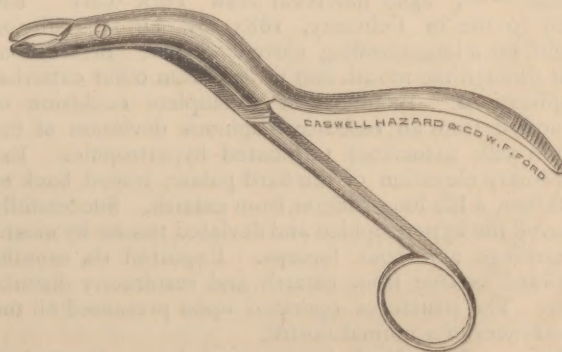


FIG. 10.

exercised over the cutaneous surfaces of the *alæ nasi*. No foreign substances disturb the equilibrium of the inner nares, and, therefore, the above undesirable consequences are avoided. The pressure of the splint can be nicely regulated by the patient by means of a delicate screw. Any tendency to loosen may be easily overcome by affixing adhesive plaster to the pressure-pads, and then sticking it to the skin.

This rhinometer (Fig. 11) is used for measuring the size and shape of normal and diseased nares.

Pain.—I will not weary you with more than a passing reference to cocaine. My experiences have been already recorded, with a series of reported cases.¹ I con-

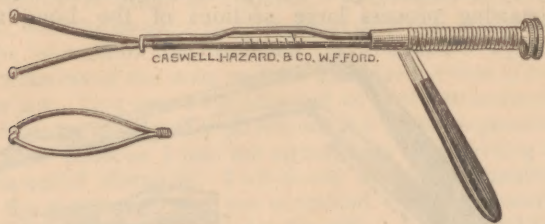


FIG. 11.

tinue to find it useful in operations on the septum, and consider it more effective when the displacement is situated well anteriorly, or less when deeper within the nares. Believing with Jebinek in the increased efficiency of concentrated solutions. I employ a ten per cent. preparation of Foucar's cocaine hydrochlorate. In spite of every precaution, extreme pain will be at times inflicted in a certain class of cases. In these instances I employ rhigolene in the form of a fine spray, with the same success as already reported by me. I have now been using it for more than a year. Pain is an actual impossibility when rhigolene is properly employed for this purpose.

The great and only objection to its use in the nose is the danger of an explosion. This I have effectually removed by employing an electric light isolated in a glass bulb. The carbon filament is rendered incandescent by means of Mr. W. Foster's electric cell. This cell is the same exhibited by me at the last meeting of the New York State Medical Society, and continues to prove highly satisfactory in my hands. It amounts really to a combined battery and secondary accumulator in a single cell, and runs without refilling for many months. Foster's portable mercury bisulphate battery may also be employed for the same purpose.

ILLUSTRATIVE CASES.

I shall very briefly report three cases selected as examples from a number of the same kind:

Mr. —, from St. Catherine's, Canada; aged twenty. Referred to me, March, 1882, by Dr. W. H. Snow. Very much annoyed by constant accumulation of phlegm in throat and larynx, and by nasal stenosis. Examination: Post-inferior turbinated hypertrophy (bilat.), localized deviation of septum to left. Turbinated obstructions and deflected septum removed in twelve operations by means of transfixion needles and *écraseur*. The patient reported in person two years subsequent to the operations, pronouncing himself perfectly well.

Miss —, aged nineteen, New York City. Referred to me in February, 1884, by Dr. J. Williston Wright, for a long-standing chronic coryza. Breathes at night through the mouth and suffers from other catarrhal complications. Examination: Complete occlusion of left nostril from an osseo-cartilaginous deviation of the septum with associated turbinated hypertrophies. Extraordinary elevation of the hard palate, traced back to the father, a life-long sufferer from catarrh. Successfully removed the hypertrophied and deviated tissues by means of cartilage and bone forceps. Reported six months afterward as free from catarrh and respiratory disturbances. The structures operated upon presented all the appearances of a normal nostril.

Dr. —, New York State; aged forty. December, 1884. Complete occlusion of left nostril, with partial and increasing deafness. Extreme general deviation of cartilaginous septum to the left. Operated twice with Steele's forceps, using elliptical glass tubes and nasal clamp, with rhigolene and cocaine. Stenosis and pressure relieved. Decided preference given to nasal clamp and rhigolene. The good results reported as permanent.

25 EAST THIRTY-FIRST STREET.

¹ THE MEDICAL RECORD, December 13, 1884.

ON THE CHOLERA OF EGYPT IN 1883, AND FRANCE, ITALY, AND SPAIN IN 1884.

By JOHN C. PETERS, M.D.,

NEW YORK.

I HAVE read many brilliant essays of late on these topics, but not with unalloyed pleasure, for I believe that many writers have fallen into errors which it is important to correct. No really well-informed person has believed for a long time that carbolic alcohol will destroy the cholera poison; but many fully and correctly believe that real germicides will. It has been known since 1872 that microbes, bacilli, and bacteria could live in very strong solutions of carbolic alcohol, and that the dilute mineral acids, tannin, chloride, corrosive sublimate, and others would kill them.

In 1883 cholera did not arise alone in Egypt from filth, but from importation. It did not commence at Alexandria, but at Damietta, which is the nearest Nile port to Port Said, which is the outlet of the Suez Canal. These were 37,500 deaths from cholera in the Bombay Presidency in 1883. Bombay merchants came both to Port Said and Damietta to attend a great fair there, to which at least 15,000 people congregated, in addition to the 35,000 inhabitants. The barbers who shave and prepare the dead are the first registrars of vital statistics in many Egyptian towns, and the principal barber of Damietta was among the first to die of cholera; hence all the earliest records of deaths were lost, and the more fatal and infective diarrhoeal cases were never recorded. Next the principal European physician of Damietta had his attention called to the rumors of numerous deaths, and investigated the matter to find that cases of cholera had occurred in May, whereas none had been reported publicly until June 21st. A *zadig*, or canal, runs through Damietta from one branch of the Nile to another, and this is the principal source of the water-supply.

Mosques and many houses are on the banks of this canal, and their drainage goes into it. Every mosque has a public privy, and also a tank for the ablution, which all good Mohammedans must use before entering a holy place. There was, of course, great choleraic water contamination, and a sudden outburst of cholera took place. The 15,000 people who came to the fair were stampeded out of Damietta, together with about 10,000 of the inhabitants, who carried the disease with them back into Egypt. Then only was a rigid quarantine established, and a cordon put round Damietta to keep everybody in, and let no one go out, neither food or medicines, or doctors, or supplies of any kind. Such is nearly the history of every town attacked in Egypt in 1883.

When the pestilence had been let out *en masse*, severe measures were taken to keep it in Cairo, for up the Nile was attacked long before Alexandria suffered. This cholera broke out, as it almost always does in Egypt, when the river Nile is low and the water unusually bad. It disappeared like magic, as it always does in Egypt, when the Nile rises and washes all impurities away. There had been little or no cholera in Egypt since 1865, and there had often been as much filth as in 1883. It has never become endemic there, as it is a rainless country, and generally too dry for the cholera germ to thrive.

Marseilles had a small outbreak of cholera in the fall of 1883, probably derived from Egypt, which she carefully concealed. In addition, cholera was also brought to Toulon from Tonquin by the Sarthe and other vessels. Toulon concealed her cholera for at least seventeen days, and did not confess it until it had got such headway that it could no longer be concealed. At least twenty thousand Italians fled from Toulon and Marseilles, and others were brought away in transports by the Italian government. Rome refused to receive any fugitives; Genoa and Naples welcomed them. There were at least three large importations into Naples. The